

Health Consultation

Follow-up of Champion International Corporation Klickitat, Klickitat County, Washington

August 15, 2002

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Prepared by

**The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**



Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. Health consultations focus on specific health issues so that DOH can respond quickly to requests from concerned residents or agencies for health information on hazardous substances. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health. The findings in this report are relevant to conditions at the site during the time of this health consultation, and should not necessarily be relied upon if site conditions or land use changes in the future.

For additional information or questions regarding DOH, ATSDR or the contents of this Health Consultation, please call the health advisor who prepared this document:

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Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Aquifer	An underground formation composed of materials such as sand, soil, or gravel that can store and/or supply groundwater to wells and springs.
Carcinogen	Any substance that can cause or contribute to the production of cancer.
Comparison value	A concentration of a chemical in soil, air or water that, if exceeded, requires further evaluation as a contaminant of potential health concern. The terms comparison value and screening level are often used synonymously.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Environmental Media Evaluation Guide (EMEG)	A concentration in air, soil, or water below which adverse non-cancer health effects are not expected to occur. The EMEG is a <i>comparison value</i> used to select contaminants of potential health concern and is based on ATSDR's <i>minimal risk level</i> (MRL).
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short-term (acute) or long-term (chronic).

Groundwater	Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where it can be used for drinking water, irrigation, and other purposes.
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
Indeterminate public health hazard	Sites for which no conclusions about public health hazard can be made because data are lacking.
Inorganic	Compounds composed of mineral materials, including elemental salts and metals such as iron, aluminum, mercury, and zinc.
Media	Soil, water, air, plants, animals, or any other part of the environment that can contain contaminants.
Model Toxics Control Act (MTCA)	The hazardous waste cleanup law for Washington State.
Monitoring wells	Special wells drilled at locations on or off a hazardous waste site so water can be sampled at selected depths and studied to determine the movement of groundwater and the amount, distribution, and type of contaminant.
No apparent public health hazard	Sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.
Oral Reference Dose (RfD)	An amount of chemical ingested into the body (i.e., dose) below which health effects are not expected. RfDs are published by EPA.

Organic	Compounds composed of carbon, including materials such as solvents, oils, and pesticides which are not easily dissolved in water.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.
Plume	An area of contaminants in a specific media such as groundwater.
Reference Dose Media Evaluation Guide (RMEG)	A concentration in air, soil, or water below which adverse non-cancer health effects are not expected to occur. The EMEG is a <i>comparison value</i> used to select contaminants of potential health concern and is based on EPA's oral reference dose (RfD).
Route of exposure	The way in which a person may contact a chemical substance that includes ingestion, skin contact and breathing.
U.S. Environmental Protection Agency (EPA)	Established in 1970 to bring together parts of various government agencies involved with the control of pollution.
Volatile organic compound (VOC)	An organic (carbon-containing) compound that evaporates (volatilizes) easily at room temperature. A significant number of the VOCs are commonly used as solvents.

Background and Statement of Issues

This health consultation is a followup from the previous health consultation, released in September of 1999, to re-evaluate human health risks associated with physical hazards and friable asbestos at the Klickitat Valley Sawmill (KVS), in addition to potential exposure to chemicals in soil and groundwater related to former mill operations. For general background of the site, refer to the previous consultation.¹

KVS covers approximately 300 acres in Snyder Canyon adjacent to the town of Klickitat (Figure 1). A company known as Champion International Corporation (Champion) operated the mill until 1994 when it was no longer profitable, and sold the mill in 1995 to KVS. Rather than reopen the mill, KVS dismantled the mill and sold it in 1996 to a company known as Timber Creek Associates (TCA). TCA was foreclosed and the mill was put up for public auction. Some smaller portions of the mill were sold, with disclosure, to private entities. The International Paper Company (IP) purchased Champion in 2000 and is the current owner of most of the mill and primary liable party.

In 1994, soil sampling under an area of a former pentachlorophenol (PCP) dip tank indicated PCP contamination as high as 38.6 ppm (Figure 2).¹ Dioxin has not been sampled in this area. Both diesel and gasoline range total petroleum hydrocarbons (TPH-D and TPH-G) were found under the former bulk fuel facility.

In 1997, Ecology received an anonymous report of polychlorinated biphenyls (PCBs) being buried on site, and oil seeping from the ground on rainy days. Ecology also received numerous reports from former Champion employees regarding petroleum and solvent releases, stained soil, open or unprotected containers of transformer oil from the fir shed, and chlorine powder and caustic soda in the powerhouse building. Contaminated soils were reported around the planer building, the oil storage building, the paint shed, and the locomotive building where oils, solvents, and cyanide were reportedly used.¹

In February 2002, IP contracted URS Corporation to prepare a sampling workplan that would help identify the best clean-up options for the site.² Sampling performed under this workplan included 27 test pits, 10 monitoring wells, and five sediment cores to characterize 11 potential areas of concern. Fifty-two soil samples were tested for TPH and PCP. Thirty-four soil samples, 11 groundwater samples, five sediment samples, and two surface water samples were tested for multiple compounds. Maximum soil concentrations, that are above comparison values, are shown in Table 1 below. Excavation and off-site disposal has been proposed for contaminated soil.²

Table 1. Maximum Soil Sampling Results (ppm) at Klickitat Valley Sawmill in Klickitat,

Washington, February 2002

Contaminant	Maximum Concentration	Station/Depth	Comparison Value	Comparison Value Reference
Lead	2,670	TP0403-1.5'	NA	NA
Arsenic	50.1	TP0903-2'	20	Child EMEG
Carcinogenic PAHs	[^] 14.82	~Averaged over six stations	⁺ 0.1	CREG
TPH-Diesel Range Organics	13,000	TP0801-2'	*2,000	Child RMEG
TPH-Residual Range Organics	17,000			
	3,000	TP0405-2'		
	2,800	TP0802-4'		
	2,500	TP0904-6"		

NA - Lead does not have a comparison value, hence is discussed in the Discussion Section.

[^] - This is the mean toxic equivalent concentration for all carcinogenic PAHs detected.

~ - TP0105-2', TP0405-2', TP0407-3.5, TP0801-2', TP0903-2', TP0904-6"

⁺ - There is no comparison value for cancer PAHs, hence benzo(a)pyrene is used as a surrogate

^{*} - There is no comparison value for diesel, hence pyrene is used as a surrogate

EMEG - ATSDR's Environmental Media Evaluation Guide

CREG - Cancer Risk Evaluation Guide for 1E-6 excess cancer risk

RMEG - EPA's Reference Dose (RfD)

Drinking Water

Site topography is relatively flat along the floor of Snyder Canyon but slopes gently to the southeast toward the Klickitat River. Groundwater is approximately 25 feet below ground surface and also flows southeast. A shallow on-site groundwater sample taken from a monitoring well in November of 1997 was analyzed for herbicides, metals, and PCP, and found to contain low levels of PCP (0.042 ppb). This well is located approximately 60 feet down-gradient of the former anti-stain dip tank. Limited groundwater and surface water sampling performed in February 2002 did not detect PCP. No other groundwater sampling data is available.

There does not appear to be any drinking water wells down-gradient from the mill site. Residents in Klickitat are provided drinking water by the City of Klickitat public water system, which draws from two wells located approximately one-quarter mile southwest (cross gradient) of KVS. On June 26, 2002, Well 1 of this system was sampled and analyzed for PCP with no detections. No other samples from this system have been analyzed for PCP. Residents have complained about the brackish taste of the water, which is not related to KVS but due to the ion exchange

process to remove naturally occurring iron and manganese.

Asbestos and Physical Hazards

One of the major concerns with KVS is asbestos. Residents living downwind of the mill are concerned with friable asbestos or asbestos that is no longer contained in the building material but is available for dispersion into the surrounding environment.¹ Two large buildings have burnt down leaving significant piles of ash, which may contain friable asbestos, and may become airborne during dry windy periods. In June of 2002, the Department of Labor and Industries took samples of the ash from the old planer building and found no detections of asbestos, but only fiberglass. The remaining buildings left standing contain fixed asbestos which will eventually become friable as buildings continue to deteriorate or catch fire.³ For health effects of asbestos, refer to the previous consultation.¹

Another major concern at KVS is physical hazards. As stated in the last health consultation, physical hazards remain prevalent throughout the site, especially the old powerhouse building. This structure has a high potential for falling brick, metal apparatus, and other building debris. Although the site has been partially fenced on the lower east and southeast side, the rest of the site remains open with easy access. Anecdotal information suggests that children and young adults have been seen frequenting the mill site, including the powerhouse building.⁴

Discussion

Environmental sampling data were screened using federal (ATSDR and EPA), and state (MTCA method B) screening comparison values. Contaminant concentrations below comparison values are unlikely to pose a health threat, and were not further evaluated in this health consultation. Contaminant concentrations exceeding comparison values do not necessarily pose a health threat, but were evaluated further to determine if levels could result in adverse human health effects. Four contaminants in soil that exceed comparison values, lead, arsenic, TPH, and carcinogenic PAHs, are listed in Table 1 and discussed below. The primary route of exposure to lead and arsenic in soil is through incidental ingestion while dermal contact is an additional route to consider for TPH and PAHs.

Groundwater

A pathway analysis was not performed for drinking water because there are no down gradient drinking water wells. Homes and businesses near the mill are on city water, which draws from groundwater approximately one quarter mile east of the site (Figure 2). A one time sampling of PCP showed no detections in the city well. Since the city well is approximately one quarter mile cross gradient of KVS, contamination by KVS is unlikely.

Soil

The highest concentration of PCP found in soil was 38.6 ppm. This concentration is less than the child RMEG comparison value of 40 ppm, hence is unlikely to pose a health threat. Dioxin has

been known be associated with PCP at wood treating facilities, especially prior to the 1980s, indicating that dioxin could be present in soil.⁵ Thus far, dioxin has not been included in site characterization.

The previous health consultation recommended that access to the site be restricted because of friable asbestos and physical hazards. However, access to most the mill property has not been completely restricted. Although the lower east and southeast end of the site closest to Klickitat has been fenced and posted with “Danger, No Trespassing” signs, the north and south (long) sides and the west upper-end of the property remain open and accessible. Although access to the mill is not completely restricted, exposure to contaminants in soil at this site is expected to be infrequent. In addition, much of the contamination is below ground surface, which would further limit direct contact with soil.

Future exposure to the contaminants of concern listed above in Table 1 could be of concern if land use changes especially if the property is developed for residential purposes or common areas for children, such as a park or school.

Asbestos and Physical Hazards

Physical hazards exist for residents who might trespass on the site. Anecdotal evidence from the community indicates that children do access the property. In addition, piles of debris that contain friable asbestos remain uncovered on the site. While the such trespassing episodes represent only an infrequent exposure, these debris piles do represent a potential source of asbestos exposure for such individuals. Off-site migration of asbestos from these piles is also possible until they are removed or covered.

Child Health Initiative

ATSDR’s Child Health Initiative recognizes the unique vulnerabilities of infants and children deserve special emphasis regarding exposures to environmental contaminants. Infants, young children, and unborn children may be at greater risk than adults from exposure to particular contaminants. Exposure during key periods of growth and development could lead to adverse effects later in life such as learning and behavioral problems.

After birth, children may receive greater exposures to environmental contaminants than adults. Children are often more likely to be exposed to contaminants from playing outdoors, ingesting food that has come into contact with hazardous substances, or breathing soil and dust. Pound for pound body weight, children drink more water, eat more food, and breathe more air than adults, so can receive higher contaminant doses than adults.

The maximum concentrations of lead, arsenic, and diesel; and the average concentration of carcinogenic PAHs in soil exceed health comparison values. However, current site conditions indicate that exposure of children to on-site soil contaminants is minimal because children do not frequent the area and the highest contaminant levels are below ground surface. Limited groundwater and surface water sample results showed no elevated contaminants but on-site

groundwater has not been completely characterized.

Conclusions

1. Conditions at this site pose a *public health hazard* because of the presence of physical hazards. Abandoned buildings at Klickitat Valley Sawmill are within immediate proximity of the town of Klickitat, and in a seriously deteriorated condition and in danger of imminent collapse. As demonstrated by the fire destruction of two buildings, the remaining structures present a fire hazard.
2. Buildings that have already burnt down or have partially fallen down because of weathering and vandalism have left significant piles of ash and building debris which may contain friable asbestos. The presence of asbestos in these piles of ash and debris is a potential source of asbestos to those accessing the site. These piles could also contribute to off-site migration of asbestos.
3. Limited on-site groundwater sampling detected low levels of pentachlorophenol. Groundwater sample location and frequency is not adequate to assess the extent of groundwater contamination on-site and down gradient off-site. However, groundwater downgradient of KVS does not appear to be used for drinking water purposes. While the City of Klickitat public water system provides drinking water to small businesses and residences located near the mill, the water plant is located approximately one quarter mile cross gradient of KVS, hence is unlikely to be contaminated by KVS. A one-time sampling of the city wells for site related contaminants showed no detections. Therefore, groundwater contamination on-site and down gradient of the mill currently poses *no apparent public health hazard*.
4. Soil sampling detected lead, arsenic, total petroleum hydrocarbons, carcinogenic PAHs, and pentachlorophenol. Since most of the soil contamination is below ground and removal of contaminated soil is proposed, *no apparent public health hazard* exists with respect to direct contact with soil. However, if future use of this area allows unrestricted access and contaminated soil remains on site, exposure could increase beyond what is assumed in this consultation. In addition, although pentachlorophenol concentration is below comparison values, it is an indication that dioxin could be present in soil.

Recommendations/Action Plan

1. Until the site has been remediated, access should be restricted, especially to the power house building due to the unstable nature of the structure. Children should be restricted from playing on any part of the mill or property. The structures should be demolished, and all asbestos-containing materials in building debris and ash piles should be properly covered or removed and disposed of.
2. Drinking water at the Klickitat Water Plant should be sampled for pentachlorophenol a second time to ensure that this well is not impacted by PCP contamination from KVS.
3. Groundwater in already established monitoring wells should be resampled to ensure that groundwater contamination is not moving off-site. Groundwater monitoring wells should be tested for metals, phenols, cPAHs, TPH, and VOCs.
4. Dioxin should be analyzed in soil where pentachlorophenol has been detected.
5. Exposure to contaminants in on-site soil should be reevaluated if land use changes.

Action

Results of future environmental sampling should be provided to DOH for evaluation of potential health impacts. Copies of this health consultation will be provided to Klickitat County Health District, Ecology Central Regional Office, Department of Labor and Industries, all potential liable parties, and accessible to citizens of Klickitat.

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References

1. Champion International/ Klickitat Lumber Mill (a/ k/ a Klickitat Valley Saw mill). S. Matthews. September 1, 1999.
2. Agency Review Draft. Work Plan Addendum. Feasibility Study/ Clean-up Action Plan. Klickitat Saw Mill Site. International Paper Project team/ J. T. Griffith, URS Corporation. February 2002.
3. Champion International Corporation, Limited Asbestos Survey, Klickitat Facility, Pacific Rim Environmental, Inc., R. Burnham, 1994.
4. Telecon with B. McClure, June 12, 2002.
5. Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds. Exposure Assessment and Risk Characterization Group, National Center for Environmental Assessment. U.S. Environmental Protection Agency, Washington DC. September 2000.

Figure 1

Figure 2

Certification

This Health Consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

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